

# Galvanizing Advances in Market-aligned fusion for an Overabundance of Watts (GAMOW)

## Export Control Considerations

---

**Daniel J. Campbell, J.D.**

**Export Control Officer**

**Savannah River Nuclear Solutions, LLC**

---

# What is an Export?

- **An actual shipment or transmission of commodities or technology out of the United States**
- **The sending or taking of an item out of the United States, in any manner**
- **Releasing or otherwise transferring technology to a foreign person in the United States**
- **Teaching a foreign person how to use a controlled commodity within the United States**

***15 CFR 734.13***

**Relevant hyperlink:** [15 CFR §734 Scope Of The Export Administration Regulations - Code of Federal Regulations \(ecfr.io\)](#)

# What is a Foreign Person?

---

**A foreign person is someone who is not:**

- **A citizen of the United States**
- **A permanent resident alien of the United States (a “green card” holder)**
- **A protected refugee**
- **Includes corporations, associations, etc. not incorporated in the United States, and foreign government entities**

**Relevant hyperlink:** [15 CFR § 772.1 Definitions of terms as used in the Export Administration Regulations \(EAR\) - Code of Federal Regulations \(ecfr.io\)](#)

# Fusion Energy Export Controls

---

- **Current regulations apply no export controls to the fusion reactor itself**
- **National Nuclear Security Administration (NNSA) regulations recognize that there may be export controls on supporting systems [10 CFR 810.2(c)(4)]**
- **Hydrogen isotope separation systems associated with fusion reactors are specifically identified [10 CFR 810.2(b)(7)]**

**Relevant hyperlink:** [10 CFR §810 Assistance To Foreign Atomic Energy Activities - Code of Federal Regulations \(ecfr.io\)](https://www.ecfr.io/10-cfr-810)

# Tritium Export Controls – Equipment and Facilities

- **Equipment and facilities export controls are derived from the Nuclear Suppliers Group Dual Use Technologies list (international obligation)**
- **Controlled under Department of Commerce regulations [15 CFR 774, Supplement 1]**
- **Plant and equipment for the production, recovery, extraction, concentration, or handling of tritium are controlled [ECCN 1B231]**
- **Includes metal hydride storage and purification, isotope separation, and cryogenic equipment**
- **Tritium equipment and facilities technologies are also controlled [ECCN 1E001]**

## **Relevant hyperlink:**

<https://www.bis.doc.gov/index.php/documents/regulations-docs/2332-category-1-materials-chemicals-microorganisms-and-toxins-4/file>

# Tritium Export Controls

---

- **Tritium, and compounds or mixtures containing tritium are controlled for export by the Nuclear Regulatory Commission (NRC) [10 CFR 110.23]**
- **A specific authorization is needed to export tritium for recovery or recycle purposes**
- **For tritium contained in sources, signs, luminescent dials, etc., a general license is available for limited quantities**

**Relevant hyperlink: [§ 110.23 General License For The Export Of Byproduct Material. | NRC.gov](#)**

# Other Export Controlled Commodities

- Lithium enriched in  $^6\text{Li}$  [15 CFR 774, Supp. 1, ECCN 1C233]
- Lithium enrichment equipment and facilities [10 CFR 110, Appendix N]
- Remote manipulators [15 CFR 774, Supp. 1, ECCN 2B225]
- Gloveboxes [15 CFR 774, Supp. 1, ECCN 0B999]
- Tritium target assemblies [15 CFR 774, Supp. 1, ECCN 1A231]

**Relevant hyperlinks:** [Appendix N To Part 110—Illustrative List Of Lithium Isotope Separation Facilities, Plants And Equipment Under NRC's Export Licensing Authority | NRC.gov](#)  
[Export Administration Regulations \(EAR\) \(doc.gov\)](#)

# Authorized Destinations

## NNSA Regulations

- Argentina
- Australia
- Austria
- Belgium
- Brazil
- Bulgaria
- Canada
- Chile
- Colombia
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Egypt
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Indonesia
- IAEA
- Ireland
- Italy
- Japan
- Kazakhstan
- Korea, Republic of
- Latvia
- Lithuania
- Luxembourg
- Malta
- Mexico
- Morocco
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- South Africa
- Spain
- Sweden
- Switzerland
- Taiwan
- Turkey
- Ukraine
- United Arab Emirates
- United Kingdom
- Vietnam

## NRC Regulations

- Argentina
- Australia
- Austria
- Belarus
- Belgium
- Brazil
- Bulgaria
- Canada
- China
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Italy
- Japan
- Kazakhstan
- Latvia
- Lithuania
- Luxembourg
- Malta
- Mexico
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Republic of Korea
- Romania
- Russia
- Serbia
- Slovak Republic
- Slovenia
- South Africa
- Spain
- Sweden
- Switzerland
- Turkey
- Ukraine
- United Kingdom

# Authorized Destinations – Department of Commerce

---

- **The Department of Commerce does not have authorized destinations**
- **Instead, the DOC has produced an extensive chart called the Country Chart**
- **Depending on the commodity or technology, a country may or may not require a license for export of that commodity or technology**
- **For example, there is no license requirement to ship hydrogen isotope separation equipment to Canada, but there would be to Indonesia**
- **Other factors include dollar value of the shipment, quantities of materials in the shipment, and availability of license exceptions**

# Restricted Destinations

## NNSA Regulations

- **Any country not an authorized destination**

## NRC Regulations

### Restricted Destinations

- Afghanistan
- Andorra
- Angola
- Burma (Myanmar)
- Djibouti
- India
- Israel
- Libya
- Pakistan
- South Sudan

### Embargoed Destinations

- Cuba
- Iran
- Iraq
- North Korea
- Syria
- Sudan

Relevant hyperlinks: [15 CFR §738 Commerce Control List Overview And The Country Chart - Code of Federal Regulations \(ecfr.io\)](#)

[10 CFR §110 Export And Import Of Nuclear Equipment And Material - Code of Federal Regulations \(ecfr.io\)](#)

[10 CFR §810 Assistance To Foreign Atomic Energy Activities - Code of Federal Regulations \(ecfr.io\)](#)

# Restricted Destinations

## Department of Commerce Regulations

- Cuba
- Iran
- North Korea
- Syria
- Sudan

## Department of Treasury Sanctions

- Balkans Related
- Belarus
- Burundi
- Central African Republic
- Chinese Military Companies
- Counter-Narcotics
- Counter-Terrorism
- Cuba
- Congo
- Global Magnitsky
- Hong Kong
- Iran
- Iraq
- Lebanon
- Libya
- Mali
- Nicaragua
- Non – Proliferation
- North Korea
- Rough Diamond Trade
- Syria
- Transnational Criminal Organizations
- Ukraine / Russia Related
- Venezuela
- Yemen
- Zimbabwe

# Key Takeaways and Additional Information

---

- Know who you are dealing with, even if it is just a technical discussion with foreign colleagues
- If something doesn't quite appear right, challenge it
- Seek help navigating export control law, it changes frequently

Additional Links:

Commerce: [BIS Website \(doc.gov\)](#)

NRC: [Part Index | NRC.gov](#)

NNSA: [10 CFR Part 810 | Department of Energy](#)

Treasury: [Sanctions Programs and Country Information | U.S. Department of the Treasury](#)